

MEMORANDUM FOR: Director of Logistics

SUBJECT : Discussion Paper - Transitions of Agency
Space Posture

REFERENCE : Memo fr DD/A to D/L dtd 4 Dec 74; Subject:
Pros and Cons of a "Special Purpose Use"
Or "People Use" New Building at Headquarters

1. In response to the tasking of the reference and per your request for supplemental information concerning the status of Agency space holdings, submitted herewith is a discussion paper entitled "Transitions of Agency Space Posture."

2. The intent of the paper is to address the Agency's space and facilities posture in terms of past, current, immediate future, and long-range time frames. It also examines space and facilities posture transitions to gain a greater perspective of Agency development trends in order to assess current status, to project future short- and medium-range conditions, and to plan an overview of conceptual options and alternatives relative to long-range space and facilities needs.

3. In this context, this paper provides a broad conceptual overview of such time frames and potential options as related to known and projected Agency space and facilities needs and as limited by various qualifying parameters and stated assumptions which will require additional and continuing

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in-depth study. Within this framework, the pros and cons of our determining to erect a building on the Langley campus designed either for "Special Purpose Use" or "People Use" is discussed.


4. The opinions, assessments, projections, and conceptual planning options expressed by the writer are a measure of his past and present observations and involvement in the development of Agency facilities planning and of general coordination with Agency representatives involved with day-to-day, current, and immediate future space and facilities needs of the Agency. Reestablishment and current staffing of the Building Planning Staff (BPS/RECD) is intended to study these general conceptual options and other potential options in detail in order to ensure the most beneficial results for the Agency and to influence a determination of the most effective direction for a new Agency building program.

5. This paper is intended as a discussion medium, as a point of departure, and as a vehicle through which one might present a collection of impacting conceptual variables which attempt to shed more light upon where we as an agency have been, where we are, and where we may be going as a basis for present and future decisionmaking.

6. The paper is divided into several parts for reasons of clarity. Each part was written to stand alone^{and}, as a result,

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repetition of certain information in the various parts was intended. Although the paper may appear to be lengthy, such length was deemed appropriate and necessary to adequately scratch the surface of such a broad subject.


Deputy Chief
and
Chief, Building Planning Staff
Real Estate and Construction Division, OL

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PROS AND CONS SUPPORTING THE RATIONALE FOR ERECTION OF EITHER
A SPECIAL PURPOSE USE OR PEOPLE USE BUILDING IN A PROPOSED NEW
BUILDING PROGRAM, HEADQUARTERS COMPOUND

Parameters of Approach

In order to thoroughly address a new building program, one must examine the variety of possible variables of approach which could have an impact upon final decision-making. These approaches will range from small, medium, intermediate, and large scales of program involvement and probably will involve combinations of such variables. It is realized that unlimited variables do exist and it would require extensive study to so identify them. For the purposes of this discussion paper, major parameters of approach are presented as follows:

1. Consider immediate Headquarters Building special purpose and office space problems only.
2. Consider external building special purpose and office space requirements only.
3. Consider a combination of all or part of the totality of special purpose and office space problems and requirements of both Headquarters and external functions.
4. Consider the implementation of the three complex total Master Plan building program.

5. Consider the implementation of one or two of the two new complexes of the Master Plan.

6. Consider the implementation of a portion of either of the two new complexes of the Master Plan.

7. Consider the phased implementation of one or both new complexes of the Master Plan.

Parameters - Restrictive, Supportive, Variable Impacting

The range of positive, limiting, and variable parameters which could influence the scale and direction of a building program is quite extensive. A general overview of these factors includes property, jurisdictional considerations, approved master planning, external leases, time frames, personnel levels, and organizational idiosyncracies. More specifically, they are as follows:

Restrictive:

1. Property for the South, Maintenance and Services, and Visitor Complexes is yet to be acquired by the Agency.

2. The moritorium restricting connection to sewage systems served by the District of Columbia Blue Plains Sewage Treatment Plant.

Supportive:

1. Property for the Northwest Complex is presently assigned to the Agency.

2. The National Capital Planning Commission (NCPC) has approved the Preliminary Master Plan Concept.

3. The Agency has made a determination that the Preliminary Master Plan concept does not have a detrimental effect upon the environment.

Variable Impacting:

1. Success and flexibility of imminent lease negotiations for external commercial leased buildings.
2. Timing.
3. Changing personnel numbers.
4. Reductions and expansions of functions.
5. Compatibility of organizational grouping.
6. Acceptability of functional separation or necessity for functional unity.
7. Priority of operational continuity.
8. Energy conservation.
9. Environmental impact.

Assumptions:

In view of the above variable parameters, it was determined that a judgment factor should be applied to create a list of logical assumptions which would provide a^{sound} basis for further discussion concerning the pros and cons of a "Special Purpose Use Building" versus a "People Use Building." The assumptions are listed as follows:

1. Development of the Northwest Complex as the first stage of Master Plan implementation is most feasible since it would be located on Agency property and contains no existing facilities.

2. Implementation of the Northwest Complex can be accomplished in total or in phases.

3. Expansion of the PSD Building can be considered an implementation phase but part of a total systems design approach for the Northwest Complex.

4. The remainder of the Northwest Complex could be a series of buildings or one large building containing underground structured parking facilities.

5. The implementation of a series of buildings concept could be accomplished in total or in phased construction and in phased occupancy.

6. Consideration of the South, Maintenance and Services, and Visitor Complexes of the Master Plan, for the purposes of this study, were not considered due to the requirement for additional property and the relocation of existing functional areas (South Parking) on Agency property.

DISCUSSION

Purpose
Pros and Cons of "Special Use Building" versus "People Use Building"

The following rationale will be discussed within the context of the background, setting, and transitions of Agency space posture (historical, past, current, immediate future, long-range future) as presented in accompanying portions of this paper. Rationale will also be consistent with the framework of parameters and assumptions stated above.

General

The original design concept of the Headquarters Building envisioned the utilization of the towers (Floors 2 through 7) as standard general office use space. The deep abstract-shaped base structure (ground and first floors) was intended to be utilized as a combination of high density office use occupancy, special purpose functions, general multi-personnel use areas, service areas, and major personnel circulation areas. Approximately one million net square feet of space in Headquarters Building are distributed equally in tower and deep-base space. The irregular-shaped basement floor and the penthouses contain major building utilities systems.

External buildings consist of multi-story structures designed for office use but utilized as standard office

in general and as modified special purpose use at random locations in each facility.

Pros and Cons of a "People Use Building"

The determination to erect a "People Use" (Standard general office) facility at the Headquarters site would involve an evaluation and assessment of several plus and minus factors. These issues and considerations may be supportive or limiting depending upon the combination of acceptable variables one decides to assume. For the purposes of this portion of the paper, it will work within the general framework of assumptions stated above and "freewheel" to a certain extent.

The concept of erecting a new "People Use" office building could inherently surmise that its primary occupants would be the standard office space requirements from external facilities to achieve consolidation and to overcome the inefficiencies and constraints of continued leasing. It would also appear that equal consideration may be given to Headquarters Building office component needs on a lesser scale basis and that a major portion of potential Headquarters candidates would be considered on a second priority basis depending upon the size and scale of the proposed building.

The relocation of part or all of the pure office type space from external buildings and supplemental selected components from Headquarters Building to a new Headquarters office building could pose some problems and

considerations for thought at this time such as:

1. The Master Plan requires three major building complexes to provide for consolidation of all MWA Agency functions.

2. The construction of the second complex would not be large enough and external buildings would have to be retained until construction of the third complex.

3. The separation of pure office space from special purpose space is not possible in all instances due to necessary organizational and functional relationships. Therefore, various combinations of pure office and special purpose space in external buildings must remain or be relocated to Headquarters Building in areas vacated by previous pure office space occupants. Similar circumstances occurring in Headquarters Building would require retention of required pure office-special purpose space combinations in Headquarters Building.

4. Depending upon the size of the new office-type building and space vacated in Headquarters Building, possibly one external leased building could be disposed of and the remnants of its pure office-special purpose space combinations could be relocated and consolidated in remaining external buildings or space in Headquarters Building. Such costly relocations of this special combination-type space to other external buildings would result in only an interim solution to the problem since these special purpose spaces would have to be moved again

to Headquarters Building at a later date when the third projected building complex (South Complex) is constructed.

If the organizational relationships of pure office-type components is acceptable, functional, and compatible in a new standard office building, very much of the undesirable high-density office occupancy space of the ground and first floor of Headquarters Building could be eliminated. Pure office space components which must remain in Headquarters Building could be relocated to the tower office space as it is vacated in the move of components to the proposed new office building. The ground and first floor deep-base space would then be utilized for all present special purpose space, new and expanded independent special purpose space, office-special purpose space combination functions, desired high-density occupancy office space functions, general multi-personnel use areas, service areas, and major personnel circulation areas.

In essence, the design and construction^{of} a new pure office building could provide relief to some of the less than desirable personnel comfort and occupancy conditions in certain parts of the Headquarters Building and, accordingly, the lower deep-base space in Headquarters Building could more appropriately be used for functions suitable to this character of space. In view of the continuing national concern for energy conservation, systems efficiency, and appropriate use of resources, new design concepts could be applied to maximize systems response and

building performance to suit the above objectives. Application of advances in the state of the art of building utilities systems design relative to energy conservation and building design layout flexibility could be most beneficial to the Agency in addressing and solving more of its perplexing space and environmental control problems.

The conceptual determination to erect a pure office building as the first phase of a building program necessarily assumes that all external special purpose space will be relocated either to the ground and first floors of Headquarters Building or to the proposed third (South) Building complex if total Agency MWA consolidation is to be eventually achieved. Implementation of such special purpose space in the proposed South complex would be hindered due to the lack of sufficient Agency assigned property on which to construct this complex for the foreseeable future. In view of this concept, the above considerations, and external time constraints, it would appear that special purpose area development through expansion moves from external buildings, and new requirements would be accomplished on the ground and first floors of Headquarters Building.

In actuality, under this concept, the two base floors of Headquarters Building would become the nucleus of a special purpose building and would also include the multi-public use and services areas. There are various

and some which are less supportive. On the surface, the concept appears like an excellent and natural approach to our overall "people space" and "equipment space" needs. One might also conclude that this concept should be perpetuated due to the extraordinary sum of funds previously expended in sunk costs to date for implementation of new and expended special purpose areas and of related new, expanded, and upgraded utilities support systems to serve them in these areas. It may also be concluded that consolidation of all special purpose functions in this space will enhance operational efficiency, use existing utilities support systems more efficiently, and reduce the total energy use relative to decentralized operations.

However, one must address the original intent of the Headquarters Building design relative to the impact of implementing expanded special purpose use space on the ground and first floor in the future. The Headquarters Building was essentially designed as a "people use" building and its utilities support systems were accordingly scaled and designed to suit this character of need. The deep design of the ground and first base floors was the most important factor in providing high density open office space and thereby allowing more Agency components to be relocated to Headquarters Building. It has served its purpose reasonably well and has avoided the retention

of even more external space. The general utilities support systems consisted of a standard central chilled water distribution HVAC system, a network power distribution system, and two manual-start emergency generators to serve minimal lighting, personnel safety, and reduced general utilities services needs in event of a total commercial power failure.

A minimum of sophisticated environmentally sensitive special purpose areas were originally designed and constructed in Headquarters Building. Attachment _____ delineates the scale of such space which includes the original DDP/RID "Walnut" computer center and the original DDI/OCR "Minicard" processing center. Independent and redundant backup utilities support systems were provided for each function. At that time, less sophisticated equipment functions in the Communications Center, and the various operating EDP functions were served by standard building utilities systems.

The requirements for a new DDS&T/OCS computer center, an expanded DDO/RID computer center, and a new DDS/OC Max II computer center; and the requirement to have redundant backup utilities reliability resulted in a first phase utilities expansion consisting of the installation of a 2,500 kW automatic-start critical power generator and independent backup air conditioning systems

for these ESE areas. Attachment _____ indicates the expanded scale of ESE areas.

In keeping with the policy of systems redundancy and reliability, Phase II of utilities systems expansion is presently underway. These actions include the expansion of power vault "B," the installation of a new 500-ton chiller in the basement, and the installation of a 1,200 kW UPS system in a portion of the Director's garage. These expanded systems are intended to provide for present and some expanded needs and include capacity for the relatively new DDS&T/OEL computer center and the new DDA/OJCS Project ORACLE computer center.

Under this concept of systems redundancy and reliability, the proposed OJCS computer center expansion will require a Phase III expansion of our utilities support system. The loads on the existing 2,500 kW critical generator are essentially at capacity and a second 2,500 kW critical generator will be necessary to provide the redundant power backup deemed necessary.

Implementation of the new proposed project SAFE computer center, as requested by DDI/CRS, will require a Phase IV expansion of our utilities system. The continuing need for redundant power will require the additional expansion of another power vault. The implementation of the OJCS expansion will surpass the capacity of the UPS system presently being installed. For existing OJCS, ORACLE,

ISG, OC, and OEL computer centers. Therefore, it is anticipated that new, independent UPS systems will have to be installed to serve DDI/CRS project SAFE and the DDA/OC Communications area computer centers.

If one were to project future utilities system growth needs based on the above rate of ESE area expansions, one might expect the 2,500 kW critical generator projected for Phase III utilities expansion to be loaded to capacity on or about FY 1980. At this time, a third 2,500 kW critical generator may be required as a Phase V utilities expansion for new and expanded special purpose areas.

Under the eventual consolidation of special purpose space on the ground and first floor, one would have to consider the provision of additional utilities systems for relocated special purpose areas such as:

1. Laboratories, dark rooms, and sophisticated photo-processing centers from the 2430 E Street complex.
2. Computer centers from Ames Building.
3. Computer center and Message Center from Key Building.
4. Computer centers from [REDACTED]
5. Laboratories and specialty functions from OTS/CMRL [REDACTED]

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These functions would, of course, require additional power and air conditioning. The laboratories, dark rooms, and photo processing functions would require sophisticated plumbing, exhausts, and ventilation which are beyond

the intent and scale of the original utilities systems design in Headquarters Building. Major and costly utilities systems modifications, expansions, upgrading, and creation of new supplemental support systems would be required in the areas of water supply, water drainage, water treatment, and air supply and exhaust.

Although sufficient area could be made available on the ground and first floors of the Headquarters Building for ESE and special purpose area consolidations, sufficient area is not available in existing centralized utilities equipment areas to provide for the utilities support systems expansions elaborated upon above. In order to achieve this goal, pure operational space would have to be utilized to provide for new and expanded centralized satellite equipment centers. Very costly interlock switching and control connections between original utilities centers and new satellite utilities centers would be required.

The policy of achieving reliable redundant backup utilities support systems in the past has resulted in the perpetuation of several satellite utilities x centers wherever space could be made available. Such system locations were not determined by design choice as extensions of existing systems in adjacent space, but were dictated by the use of space where it existed and could be made available in a very tight space environment.

Present utilities systems expansions have required the demolition and use of an incinerator room and the use of a portion of the Director's garage area. Projected utilities expansions in the foreseeable future anticipate the use of dispersed classified waste storage rooms and a less than adequate availability of required space. The above conditions are further exacerbated by limitations expected from the congestion created by the maze of distribution systems emanating from existing standard utilities systems areas, new and expanded backup utilities centers, inprocess expansions to backup utilities centers, and projected expansions.

In view of the above considerations and projected posture, it may be well to examine the feasibility of perpetuation of special purpose areas and their expanded utilities requirements relative to the characteristics and capabilities of our standard building utilities systems. It would be accurate to state that there is sufficient power and air conditioning capacity in our standard building utilities systems to support all our existing and projected standard office and special purpose area needs. Our network power distribution system allows the use of only one half of the total capacity of available power in order that one pair of transformers in each power vault could handle the total load of a power vault if the second pair of transformers failed or malfunctioned. This distribution posture insures redundancy

in view of in-house equipment failure, but no redundancy in case of a commercial power failure. Full capacity of our power system could be realized if it were determined to load two pairs of transformers in each power vault up to their capacity. Of course, the networks characteristics of the power system would be negated since one pair of transformers could not carry the total load and there would be a total power outage to areas served from the power vault due to partial or total malfunction or failure to in-house equipment. In case of commercial power outages or failure of one pair of transformers, ^{selected} load-shedding procedures bringing the loads to within the capacity of one pair of transformers could be conducted to provide the power vault with power from the Agency critical and/or emergency generators. Maximum air conditioning capacity is available from the powerplant but service would be interrupted during a commercial power failure.

Past experience indicates that total commercial power failures have been minimal and there has been little interruption of commercial service to the Agency. If the Agency were receptive to the full power capacity mode of operation which, in case of commercial power failure or in-house equipment failure, would provide selective and automatic load shedding and allow critical and emergency power use within the capacity of pairs of transformers, minimal but not total pure redundancy could be achieved.

A higher level of operational efficiency could be achieved with our present general utilities systems resources. Accordingly, the need to create new special utilities systems could be reduced, if the policy of less than total pure redundancy could be acceptable and the priority and capacity of critical and emergency requirements could be limited to existing or in-process implementation of utilities resources.

A most recent in-depty study addressed the posture and status of Agency ESE areas in Headquarters Building. It essentially concluded that both physical and utilities support systems conditions in present ESE area ground floor locations are in such a congested and limited state that continued and interrupted functioning of these areas could not be assured. The study recommended the modification of a large area on the first floor with adequate state of the art facilities provisions in which all ESE functions could be relocated and reliably served. The intent of the study was to solve for known, predictable, projected, and reliable ESE area and systems needs for the short, medium, and long-range future. If all special purpose areas are to be consolidated in Headquarters Building, as suggested by the premise to construct a new "People Use" building on the site, one must consider the distinct possibility that new relocation facilities for presently inadequate ESE areas must still be provided within the Headquarters Building as recommended in the study and

indicated in Attachment _____. The advisability, practicality, and suitability of implementing this approach in Headquarters Building as compared to providing new updated facilities for all ESE functions in a new special purpose building raises serious question as to the feasibility of constructing a new office-type building in preference to a special use-type building.

Pros and Cons of a "Special Purpose Use Building"

The determination to erect a special purpose use building at the Headquarters site may be supported by the rationale that the Headquarters Building was predominantly designed as a people use standard office building and, therefore, its physical features and utilities systems would more properly serve continued people use functions. Through the years, crisis and priority operational requirements have imposed special use functions upon the building and its utilities systems. Accordingly, space and utility systems have been modified, upgraded, supplemented, and expanded beyond the intent of the original design to satisfy and serve these new special purpose needs. Perpetuation of these utilities support systems expansions continue in a building lacking in adequately sized and properly located space in which such expansions should occur. Each time such new systems and expansions are implemented, to solve for immediate operational needs, a compromise must be made relative to systems design due to dispersed space locations, physical constraints, and congestion limitations. We are responding to the operational needs as they occur and as they are foreseeable within our only present and immediate future option, Headquarters Building. The price of such implementation is money, of course, but more importantly the real cost results in a maze of sophisticated systems

less than ideally designed and in forced appendages in less than desirable locations and conditions. Can we afford the recurring cause and reaction approach to our long-range special use needs in Headquarters Building and continue to perpetuate the same cyclic conditions and address even more difficult problems year after year? Would it eventually be self-defeating and would it ever be a total solution to our needs for the long range?

This rationale suggests more serious consideration for the support of a new special purpose use building. The design of such a building would apply the start of the design art to facilities and utilities systems planning and also incorporate energy conservation measures. Utilities support systems would be designed to provide for present, future, long-range, and allow for even further time frames. A total systems design providing for incremental additions of equipment and distribution systems within reserved distribution paths, within a planned master distribution scheme, and within reserved space for such expansions for the long range and beyond would allow for the utilities systems future growth patterns. This action plan could be implemented within a reserved utilities area building envelope when and as needed. In essence, the design and erection of a special purpose facility with a predesigned, expandable utilities systems potential for special purpose ^{use} would provide an organized and built in vehicle for growth and change.

Such a vehicle would appear to outweigh the relative benefits of consolidating special purpose areas in the ground and first floors of Headquarters Building and of the forced results of facilities restricted utilities expansions.

Under the concept of a new special purpose use building, it is very possible that all but a few special purpose areas would be relocated from Headquarters Building. Technical considerations may limit such a pure and total move. The large investment incurred by the Agency in sunk costs for special power systems and air conditioning systems upgrading and expansions would not be lost. These critical power and air conditioning systems could be made to serve the Headquarters Building in an office-use mode during commercial power failures if desired. This critical power could be used during commercial power outages for special purpose functions which must remain in Headquarters Building, more extended coverage of sensitive operational office functions, selected large air handlers in the four major building fan rooms, the cafeteria, and a multitude of other ^{office} type functions presently served by critical power. Independent air conditioning systems previously installed in Headquarters Building for special use functions could be slightly modified and be more efficiently used and exercised in a prime operating mode during the winter months to provide

all the winter chilled water requirements of the main building and thereby possibly eliminate the need to operate any of the high-capacity powerhouse chillers and the cooling towers. Since the Headquarters Building independent air conditioning system consists of three chillers (500 tons, 200 tons, and 200 tons), it offers a flexible variety of minimal, intermediate, and maximum levels of output that could be varied to equate with the building winter chilled water demand at any given time. Chillers at the powerhouse do not offer such flexibility since their capacities are either 1,000 tons or 1,500 tons. During winter operation, the powerhouse chillers are most inefficient since the winter cooling load is far below rated output capacity of the smallest unit. Various portions of the Headquarters Building independent air conditioning system could also be connected to critical power and continue to serve more sensitive office-type and residual special purpose areas in commercial power failures during both the winter and summer seasons.

The areas vacated by special purpose functions on the ground and first floors of Headquarters Building would essentially be deep, wide open space interrupted by structural columns. It would be most ideal for wide open office-use applications of the relatively new landscape planning approach which is becoming widely and successfully used in Government and private industry.

The Agency is presently experimenting with this landscape layout planning technique on a trial basis in Key Building. As previously mentioned, the raised pedestal floors of large, vacated computer areas could be retained for office use. Tile could be removed from raised floor panels and replaced with square carpet inserts and thereby create a floor continuity for open landscape planning and occupancy. In many instances new office buildings are being designed with carpeted raised floors to support similar office landscape planning techniques and to provide flexible utilities distribution to office-type functions.

The co-relocation of special purpose functions from Headquarters Building and external buildings to a new special purpose building would most likely result in more efficient consolidation of certain functions and eliminate the possible duplication of functions caused by decentralization. Added features could be achieved through flexible design techniques to avoid the physical restriction dilemma experienced in Headquarters Building. The design concept would attempt to provide an unlimited expansion potential of all special purpose areas in all directions by placing functional but easily movable buffer zones around their periphery.

For the reasons discussed above, the erection of a special purpose building with its predesigned flexibility of use and utilities support expansions would appear to be most beneficial to the Agency since it is creating a facility to be used in the present and future for the purposes it was designed. In the event of future emergencies or conditions of operational necessity where for some justifiable reason new special purpose needs must be accomplished in Headquarters Building, existing special utilities systems will always be available to serve them as a fallback position.

ROUTING AND RECORD SHEET

SUBJECT: (Optional) Pros and Cons of Erecting a Special Purpose Use Building versus a People Use Building at Headquarters

FROM:

EXTENSION

NO.

[REDACTED] Deputy Chief, Real Estate
 and Construction Division, OL
 906 Ames

3017

DATE

31 December 1974

TO: (Officer designation, room number, and building)

DATE

OFFICER'S INITIALS

COMMENTS (Number each comment to show from whom to whom. Draw a line across column after each comment.)

RECEIVED

FORWARDED

1. Director of Logistics
1206 Ames

2 JAN 1975

LM

2. Deputy Director of
Logistics
1206 Ames

6 JAN 1975

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3. EO/OC

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Mike and Jim:

The attached paper is a copy of the first unedited rough draft of my original efforts relative to the above subject. It supplements the previous drafts and outline originally presented to you. Per discussions with the DD/A and upon his request, a similar rough draft is being submitted for his review and comment. In the meantime, I am proceeding to prepare the paper in keeping with supplemental guidance suggested by DD/A.


 Tony

Copy sent
 DD/A
 on 1-3-75
 hand-carry